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Can We Take Our Water for Granted?

By Charles Fishman

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The United States has some of the safest drinking water in the world. But for how long?

I've spent enough years reporting about the world of water that I have a favorite water main. **This particular pipe sits under a busy and prestigious neighborhood at the center of Washington, D.C. The cast iron pipe was installed in 1860. It supplies clean drinking water, as it has for 154 years, and runs under K Street, home to the capital's lobbying firms.** When those folks serve meticulously brewed coffee to their clients, they are starting with water that arrived in a pipe laid down a year before Abraham Lincoln took office. When that water main was installed, the White House was still 33 years from getting electric lighting.

There are many old water pipes buried in lots of cities. I love this one because it captures the state of ignorance Americans live in with regard to water and the work that's necessary to make sure it's always on tap to brew coffee and flush toilets. If we could cut out a slice of that water main and set it on the conference table of one of those K Street lobbying firms, would Washington's highest-paid lawyers and lobbyists drink their morning coffee from it? **These powerful people, like almost all Americans, ignore water.**

Who pays attention to the big water issues – such as do we have enough? What's the state of the water pipes in my community? In a drought, how long will my town have enough water? Who decides who gets the water we do have?

We don't consider the routine issues either. **Few of us bother to look at our water bills each month, in part because the costs are so small.** We know a lot more about our smartphones and our cable TV remotes than we do about our water.

When it comes to water, we're spoiled.

By two important measures, the United States has a great water system. First, we have among the safest drinking water in the world. Not only can you drink the tap water from Key West to Ketchikan with unthinking confidence, but in many places (New York City, Louisville, San Francisco, and Anchorage), the water tastes great, as if it comes from a cool, quick-flowing mountain stream. The exceptions to U.S. water safety are so rare that they attract urgent attention. The second way our water system is brilliant is its relentless dependability. An adult can go an entire lifetime of turning on the tap in the kitchen and never find that water is unavailable. In most places in the United States, municipal water service never fails.

Those qualities of our tap water system – safety and dependability – are the reason we're so spoiled. Our water system is functionally invisible: The pipes are buried out of sight, the water and wastewater plants tucked away in poor neighborhoods. And it works so well, we never have to think about it.

People who live without tap water, and people who live with tap water that can make them sick after a single glass (as I did in Mexico City for two years) pay attention to their water, their water system, and what they spend on water, all the time.

The invisibility of our system, which for more than 100 years has been a testament to the genius and forethought of the engineers who first designed it, is undermining that system now. The water supply system is crumbling. We just don't see it.



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ON THE COVER



There are about 1.2 million miles of water supply pipe crisscrossing the United States. (That's 26 miles of water mains for every mile of interstate highway.) We're replacing about 5,000 miles of pipe a year – a 200-year replacement cycle. That pipe under K Street might be in only late middle age – to be replaced around 2057.

So what condition are those million miles of water pipes in? Water utilities contend with 240,000 water main breaks a year. You can look at that two ways. That's 27 water main breaks an hour, every hour of every day. And, over six years, on average, every mile of water main suffers a break. **Keeping the water running – safe, reliable – takes a lot of scrambling to patch holes in pipes that we should long ago have swapped out.**

The wastewater system, which carries away our used water and handles storm water when it rains, isn't in any better shape. Among other things, the system isn't designed to handle large downpours, and so in cities from Philadelphia to Louisville to Los Angeles, we dump raw sewage into rivers, lakes, and oceans until the rain passes. Water folks call these events "combined sewer overflows," which camouflages what's actually happening. We should be appalled that in 2014, water utilities are dumping raw sewage straight into bodies of water – not as an accident, but as a routine practice. This violates the Clean Water Act, yet most cities have consent orders to fix the problem while allowing the overflows.

Our water rules – our management practices – are as out of date as that K Street water main. The way water in rivers like the Colorado gets allocated is a relic from the early 1900s, ill-suited for the demands of the 21st century. The way groundwater is managed is worse: In many places, no one even tracks how much water farmers pump out of the ground or whether that water ever gets replaced by nature.

If our big, visible lakes were being emptied as quickly as our big, invisible aquifers, there would be a mounting sense of panic. In the most urgent sense, right now both Texas and California are grinding through their third year of extreme drought, without any relief predicted. Those two states are the nation's largest in terms of people and the economy. One in five Americans lives in Texas or California; \$1 in \$5 produced by the U.S. economy comes from the economy of either Texas or California. California and Texas rank first and third in total agricultural production, together accounting for 17 percent of all our food output.

Both are wilting. That's got the attention of Californians and Texans, but most of the efforts to wrangle with the droughts in both places are incomprehensive.

Imagine doing any kind of business in the United States without reliable water. Even the digital businesses of making semiconductors and running server farms require rivers of clean water every hour. Imagine trying to eat a single meal with food that was produced without reliable water.

How did a system that is the foundation of our economy get in this condition? It deteriorated slowly, and patching has frequently taken the place of big fixes.

We often look at other countries' water systems with a mixture of sympathy because of their inadequacy, and a missionary zeal to fix them. As a result of crude sewage and waste disposal systems, half the population in India doesn't have clean water every day, or needs to walk miles to fetch it. China's bursts of industrial pollution routinely ruin the water supplies of tens of millions of people. In the Mexico City metropolitan area, 21 million residents rely on bottled water every day because the tap water is tainted by leaky sewer and water pipes.

Clean, reliable water is critical to keeping people healthy and unleashing economic opportunity. Many places need help. But we need to aim some of that energy and attention – not to mention some money – at modernizing our own system.

There is a rising wave of innovation and modernization moving through the water system. The discharges of raw sewage, for instance, already illegal, mean that the federal government is gradually insisting that 700 cities create systems to treat all their water. Philadelphia is spending \$1.2 billion; Washington, D.C., is spending \$2.6 billion. The result will be reduced pollution.

Central Florida has, over the last 25 years, created two water supply systems: one for indoor potable use and one for outdoor landscaping, using recycled water. Today, half the water used every day in Orange County, Fla., is used outdoors, and it's all delivered in purple pipes, the universal indicator of recycled water. In Central Florida, they don't water lawns and azaleas with expensive purified drinking water.

In Southern California, a region of 25 million people dependent on water imported from either Northern California or the Colorado River, there is a quiet but fast-growing movement for "water independence." **Cities in Southern California**

are maturing out of an entitlement attitude – why shouldn't we get water from other places? – to a determination to supply at least part of their water, often through sophisticated reuse.

Helped by a burst of tech companies and innovators, **cities are using digital technology to assess their pipes and sewers, to find leaks, to fix the pipes before whole streets need to be ripped up.**

Earlier this year, the leak of just 10,000 gallons of an industrial chemical from a poorly maintained storage tank into West Virginia's Elk River ruined the water supply of Charleston and 300,000 people for a month. Downstream, Cincinnati's water utility – which supplies 1.1 million people – closed its water intakes in the Ohio River for 38 hours. Cincinnati officials could detect the plume of chemicals coming their way even though the flow of the Ohio is vast enough to serve all of Charleston's daily water needs in less than a minute.

We can learn many lessons from Charleston. Water isn't overprotected in the United States – it's underprotected. **If companies can't keep water in their communities safe, they've failed at a basic responsibility. Major water utilities need to understand the risks to their raw water sources more clearly, and they need more than a single source. Local and state officials need to understand that big pipes and big treatment plants do not equal a robust water system. To insulate ourselves from further contamination, we have to modernize.**

The U.S. water system is big but brittle. And our overconfidence in the system isn't warranted, despite more than 100 years of near perfection. To some extent, it is easier to raise funds for a well in India than to overhaul our system. We need to be more active and involved.

Americans need to look at their water bills, keep up on community water issues, organize locally, and ask questions at public meetings. **There are great new technologies to help make the systems resilient. But faith in quality and dependability requires that we pay attention to water – not just in India or China, but right where we live.** – Charles Fishman